National Institute of Environmental Health Sciences

Temperature, myocardial infarction, and mortality: Effect modification by individual- and area-level characteristics

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Abstract:

BACKGROUND: Although several studies have examined associations between temperature and cardiovascular-disease-related mortality, fewer have investigated the association between temperature and the development of acute myocardial infarction (MI). Moreover, little is known about who is most susceptible to the effects of temperature. METHODS: We analyzed data from the Worcester Heart Attack Study, a community-wide investigation of acute MI in residents of the Worcester (MA) metropolitan area. We used a case-crossover approach to examine the association of apparent temperature with acute MI occurrence and with all-cause in-hospital and postdischarge mortality. We examined effect modification by sociodemographic characteristics, medical history, clinical complications, and physical environment. RESULTS: A decrease in an interquartile range in apparent temperature was associated with an increased risk of acute MI on the same day (hazard ratio Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 1.15 [95% confidence interval Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 1.01-1.31]). Extreme cold during the 2 days prior was associated with an increased risk of acute MI (1.36 [1.07-1.74]). Extreme heat during the 2 days prior was also associated with an increased risk of mortality (1.44 [1.06-1.96]). Persons living in areas with greater poverty were more susceptible to heat. CONCLUSIONS: Exposure to cold increased the risk of acute MI, and exposure to heat increased the risk of dying after an acute MI. Local area vulnerability should be accounted for as cities prepare to adapt to weather fluctuations as a result of climate change.

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Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Policymaker

Exposure : ☑

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature

Air Pollution: Ozone, Particulate Matter

Temperature: Extreme Cold, Extreme Heat

Geographic Feature: ☑

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

United States

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Injury

Cardiovascular Effect: Heart Attack

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content